NXP SAM START UP GUIDE

Version 1.0

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1. Introduction

NXP SAMs (Secure Application Module) have been designed to provide the secure
storage of cryptographic keys and cryptographic functions for the terminals to access the various types of
NXP cards.
There are the two types of NXP SAM supported: T1AD2060, and T1AR1070.

1.2. Basic requirements

- uFR Classic CS with SAM reader
- NXP SAM card inserted into connector
- Firmware version 5.100.xxx

2. Applications and code examples

2.1. SAM tool

This is application for key management when the SAM is in AV2 mode, or for personalization and switch
into AV2 mode if SAM is in AV1 mode .
Our SAM cards that come with the readers are in AV2 mode.
All examples works with SAM into AV2 mode.
Using this application can define the keys for working with the SAM itself, as well as for working with
Mifare® Classic, Mifare® Plus, Mifare® Desfire® and Mifare® Ultralight C cards.
Link for application: https://git.d-logic.net/nfc-rfid-reader-sdk/sam_tool-executable.git
Link for user guide of application:
https://git.d-logic.net/nfc-rfid-reader-sdk/ufr-doc/blob/master/SAM%20tools%20user%20manual.pdf

2.2. Mifare® Desfire® console example

This example demonstrated operations with Mifare® Desfire® card.
Supported operations with DES, 2K3DES, 3K3DES, and AES keys, which are already stored into SAM.
Using this example user may change keys for card (PICC keys), if existing one SAM key (AES Host key)
known by user, which has permission to changing PICC keys. For example, Host key number 100 version
10, has permission to change PICC keys number 101, 102, 103, and 104. These keys options, may be set
using SAM tool application.

Link for code example: https://git.d-logic.net/nfc-rfid-reader-sdk/ufr-ds-examples-c
Link for user guide:
https://git.d-logic.net/nfc-rfid-reader-sdk/ufr-doc/blob/master/uFR_desfire_console_C_example%20.pdf

2.3. Mifare® Plus console example

This example demonstrated operations with Mifare® Plus card.
Mifare Plus must in SL3 mode, to using AES keys from SAM.
Like in Desfire example, user may change AES PICC keys.
Link for code example: https://git.d-logic.net/nfc-rfid-reader-sdk/ufr-mfp-examples-c

2.4. Mifare® Ultralight C console example

This example demonstrated operations with Mifare® Ultralight C card.
Picc key must be 2K3DES type for Ultralight C card.
Link for code example: https://git.d-logic.net/nfc-rfid-reader-sdk/ufr-ulc-examples-c

2.5. Mifare® Classic console example

This example demonstrated operations with Mifare® Classic card, and Mifare® Plus card in SL1 mode, and Mifare® Plus card in SL3 mode (Classic compatible mode where AES key calculated from Crypto1 key).
Picc key must be Crypto1 type.
Link for code example: https://git.d-logic.net/nfc-rfid-reader-sdk/ufr-mf-examples-c

3. Library documentation

Link for documentation of API functions:
https://git.d-logic.net/nfc-rfid-reader-sdk/ufr-doc/blob/master/uFR%20Series%20NFC%20reader%20API.pdf
Link for documentation of serial COM protocol:
https://git.d-logic.net/nfc-rfid-reader-sdk/ufr-doc/blob/master/uFR_COM_Protocol.pdf

All function for card operations, which works with SAM, have word "SAM" into name.

Special functions for SAM operation, explained into chapter "Support for NXP SAM (Secure Application

Module)" into API document.

Revision history

Date	Version	Comment
2019-12-03	1.0	Base document